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SOVIET ROAD BUILDING USING RAIL- AND CATERPILLAR-MOUNTED CONCRETE MIXERS

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Modern methods of building concrete road surfaces are those in which the preparation, transporting, laying, curing, and finishing of concrete, and also the preparatory and final operations, are carried out in a single, continuous, technological process.

The basic methods discussed below are intended for the construction of concrete strips of standard width (7 meters), the concrete surface having a thickness of 0.20-0.23 meter, laid at a rate of 200-250 running meters per 10 hours and requiring 30-40 cubic meters of concrete per hour.

Concrete Works Using a Rail-Mounted Concrete Mixer

Usually, when constructing concrete covers, the rail forms are set on the prepared (packed and graded) earth foundation and the shoulders are formed later. If it is necessary to put a sand foundation under the concrete cover, the rail forms are installed directly on the poured and graded layer of sand; or, after the rail forms are installed, a trench is excavated and the foundation graded to receive the sand cushion, and then the shoulders are formed. The sand layer is packed with hand-operated surface vibrators, vibrating rakes, or a vibrating machine.

For the mechanized installation of the rail forms, which are carried by a narrow-gauge transport, a jib crane, running on the rail forms, is used. A tamper follows the crane to pack earth under the rail forms to keep them from sagging under load.

The components of the cement concrete (crushed rock, sand, cement) are mixed in special mechanical mixing plants and put in narrow-gauge dump cars. The narrow-gauge railroad runs along the shoulders, whose width is 2.5 meters. The dry mixture is delivered into a self-propelled concrete mixer running on the rail forms. After the cars have been emptied into the concrete mixer,

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they are run through a switch to the other shoulder. Water is delivered to the concrete mixer by a water line running alongside the road. The prepared concrete mix is poured from the concrete mixer into the bunker of a self-propelled concrete spreader. The concrete spreader lays the concrete of the desired thickness on the foundation, and the concrete is then packed and smoothed by a finishing machine. After the finishing machine comes a movable bridge, from which the transverse and lengthwise joints are made in the fresh concrete, and from which any uneven places on the concrete are leveled off.

Water is poured on the concrete and covered with special mats, plywood boards, tarpaulins, or awnings moving on wheels along the rail forms.

After the concrete hardens, the expansion joints are cleaned out with compressed air and filled with bitumen or a special mixture.

A variation of the above process is the use of dump trucks instead of a narrow-gauge railroad, widening one of the shoulders to accommodate the trucks.

#### Concrete Works Using a Caterpillar-Mounted Concrete Mixer

The components of the cement concrete are delivered from the mechanical mixing plant into dump trucks. In building one strip, the concrete mixer and the dump trucks run between the rail forms on the foundation of the cover to be laid, and a turntable for the dump trucks is constructed near the concrete mixer.

In using machines to prepare the foundation, there should be a movable bridge across the rail forms and foundation to permit the dump trucks to cross from one side of the strip to the other. The rail forms are laid by automobile-mounted cranes.

In building a two-strip cover, the concrete mixer and dump trucks move along the already constructed second strip or along its roadbed. Exits and entrances for the dump trucks are made at definite points.

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